Accommodations Toolkit

Magnification: Research

This fact sheet on **magnification** is part of the *Accommodations Toolkit* published by the National Center on Educational Outcomes (NCEO). It summarizes information and research findings on magnification as an accommodation.[1] The toolkit also contains a summary of states' accessibility policies for magnification (/nceo/accommodations-toolkit/magnification-policies).

What is magnification? Magnification is a presentation accommodation for students with visual impairments. It is most often provided via screen-magnification software used to enhance print size on computerized versions of exams (Kamei-Hannan, 2008), but it also can be provided via a physical magnification tool such as a magnifying glass (Johnson-Jones, 2017).

What are the research findings on who should use this accommodation? Research has shown that some students with visual impairments perceive that the magnification accommodation is useful when taking an assessment (Johnson-Jones, 2017; McLaughlin & Kamei-Hannan, 2018).

What are the research findings on the implementation of magnification? One study (Kamei-Hannan, 2008) found that the higher the magnification on the screen of a computerized test, the longer elementary and secondary students with visual impairments took to complete the exam. The study also found that when the font size was four times or more above the standard font size, it was more difficult for students to trace a line of text. No studies were located that addressed the effects of magnification on student performance.

What perceptions do students and teachers have about magnification? Three studies touched on the perceptions of elementary and secondary students with visual impairments. Two of the studies indicated that students preferred to use some type of magnification over no accommodation. However, the third study found that students also perceived that there were some challenges when higher levels of magnification were provided.

- Two studies (McLaughlin & Kamei-Hannan, 2018; Johnson-Jones, 2017) compared student perceptions regarding the use of magnification, large print paper assessments, and no accommodation. Both studies found that students preferred magnification over no accommodation. There were mixed findings regarding whether students preferred magnification over large print. McLaughlin and Kamei-Hannan (2018) found that secondary students with visual impairments had no preference between computerized magnification and a paper large print accommodation. Johnson-Jones (2017) examined preferences of students with visual impairments regarding the use magnification tools (e.g., magnifying glasses) and a paper large print accommodation. The large print texts used by the students who participated in this study needed to be specially printed for them. Some students noted that it sometimes could be challenging to get needed large print paper copies, so they perceived that a benefit of physical magnification devices was that they were more accessible than large print paper copies.
- One study of magnification on a computerized test found that students said they had more eye strain when the font size was four times or above the standard font size than when there was less magnification (Kamei-Hannan, 2008).

What have we learned overall? No research was found that examined whether magnification improved student performance, but several studies looked at student perceptions. Some students with visual impairments prefer to use either physical magnification tools or computerized magnification as compared to no accommodation. A research study also found that the higher the magnification, the longer it takes for the student to complete the exam, and that there may be some eye fatigue when high magnification is used.

There is a need for additional research on magnification since only three research studies were found that addressed this accommodation. There is especially a need for research on whether the use of the magnification accommodation has an effect on student performance. For example, it is unknown whether this accommodation may be less useful for students who need very high levels of magnification where only small amounts of text can be seen at a time than for students who need less magnification. There is also a need for research on whether this accommodation may be useful for some students who have disabilities other than visual impairments (e.g., print disabilities).

Footnotes

- **[1]**
  Research on magnification summarized here is also available in NCEO's searchable *Accommodations for Students with Disabilities Bibliography* (https://nceo.info/Resources/bibliographies):/nceo.info/Resources/bibliographies (https://nceo.info/Resources/bibliographies)) and in NCEO syntheses of research from 1999 through 2018 (see summaries for: 1999–2001 (https://nceo.umn.edu/docs/OnlinePubs/TechReport34.pdf), 2002–2004 (https://nceo.umn.edu/docs/OnlinePubs/Tech45/Technical45.pdf), 2005–2006 (https://nceo.umn.edu/docs/OnlinePubs/Tech47/TechReport47.pdf), 2007–2008 (https://nceo.umn.edu/docs/OnlinePubs/Tech56/TechnicalReport56.pdf), 2009–2010 (https://nceo.umn.edu/docs/OnlinePubs/Tech65/TechnicalReport65.pdf), 2011–2012 (https://nceo.umn.edu/docs/OnlinePubs/Synthesis94/Synthesis94.pdf), 2013–2014 (https://nceo.umn.edu/docs/OnlinePubs/Report402/NCEOReport402.pdf), 2015–2016 (https://nceo.umn.edu/docs/OnlinePubs/NCEOReport412.pdf), 2017 (https://nceo.umn.edu/docs/OnlinePubs/NCEOReport418.pdf), 2018 (https://nceo.umn.edu/docs/OnlinePubs/NCEOReport423.pdf), 2019 (https://nceo.umn.edu/docs/OnlinePubs/NCEOReport433.pdf). See the reports and online bibliography for additional information about the criteria used to identify studies included in this fact sheet.

References

Johnson-Jones, K. J. (2017). *Educating students with visual impairments in the general education setting* (Publication No. 10259406) [Doctoral dissertation, The University of Southern Mississippi]. ProQuest Dissertations and Theses Global.

Kamei-Hannan, C. (2008). Examining the accessibility of a computerized adapted test using assistive technology. *Journal of Visual Impairment & Blindness*, *102*(5), 261–271. https://doi.org/10.1177/0145482x0810200502 (https://doi.org/10.1177/0145482x0810200502)

McLaughlin, R., & Kamei-Hannan, C. (2018). Paper or digital text: Which reading medium is best for students with visual impairments? *Journal of Visual Impairment & Blindness*, *112*(4), 337–351. https://doi.org/10.1177/0145482x1811200401 (https://doi.org/10.1177/0145482x1811200401)

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